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Studies On Seasonal Prevalence Of Platyhelminth Parasites From Freshwater Fishes In Aurangabad District (M.S.), India

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Abstract:

Adult Freshwater edible fishes, *Channa striatus* 85 and 314 numbers of *Mastacembelus armatus* were collected and examined for parasitic infection in different seasons and region of Aurangabad District during November 2021 to October 2022. Out of total number of edible fishes, *Channa striatus* 31 and *Mastacembelus armatus* 66 were found to be infected with platyhelminth parasites. The prevalence of helminth parasites infection found in Cestode was 48% and trematode 20% in *Channa striatus*, whereas, Cestode 30.85% and trematode 7.4% in *Mastacembelus armatus*. The parasitic infection was found highest during summer season and lowest in winter and rainy season.

Key words: Freshwater fishes, platyhelminth parasites, Prevalence, Aurangabad District,

Introduction:

Fishes are the most abundant vertebrate species on the planet and best source for protein and other protein derivatives along with other amino acids and fatty acids. Ecologically, fishes are at the apex of predator-prey pyramid in freshwater and marine ecosystem. Therefore, they are subjected to the considerable infection of helminth parasites. These adversely affect fish health decrease its nutritional value and badly disturb human health and well-being (Muhammad Moosa Abro *et al.*, 2019).

A majority of freshwater fishes occurs serious illness of parasites (Trematodes, Nematodes, Cestodes and Acanthocephalans) which causes deterioration in the food value of fishes and even consequence in their death. Parasites obstruct the nutrition, metabolism, secretary purpose of alimentary canal and damage nervous system (Markov, 1961), they also disturb the regular reproduction of the host (Faust, 1949).

Fish helminths are concern with both wild and farmed fish populations and they can cause the significant economic losses in the aquaculture industry and pose a threat to wild fish populations. Some helminths can also be transmitted to humans through consumption of contaminated fish leading to a range of health problems such as, abdominal pain, diarrhea and even organ damage. It is important to

understand the occurrence and prevalence of helminths parasites in freshwater fishes as well as the factor that contribute to their transmission (Anupriya *et al.*, 2023).

Material and Methods:

Adult Freshwater fishes were collected with the help of local fisherman in different seasons and regions of Aurangabad District during November 2021 to October 2022. The collected species of fishes such as *Channa striatus* and *Mastacembelus armatus* were observed externally. After external examination, body cavity of the fishes was cut, open and gills, eyes, heart, gonads, digestive tract, liver, spleen, kidney, etc. were carefully removed and separated in the clean Petri dish containing normal saline solution. The organs were slit open carefully and observed under the microscope. Adult parasites were collected, flattening, preserved in 4% formalin and stained with Harri's Haematoxylene. Identification of cestode parasites was done with the help of 'Systema Helminthum' Vol. II (Yamaguti, 1956) and for trematode Vol. I and II (Yamaguti, 1971**).** Prevalence was determined by the following formula.

$$\textbf{Prevalence (\%)} = \frac{\textbf{Total number of infected fish}}{\textbf{Total number of fish examined}} \times \textbf{100}$$

Results and Discussions:

In the present study, 85 numbers of specimens of freshwater fishes, *Channa striatus* and 314 numbers of *Mastacembelus armatus* were observed for the parasites. Out of total number of fishes, *Channa striatus* 31 and *Mastacembelus armatus* 66 were found to be infected with platyhelminth parasites. The infection of platyhelminth parasites in different organs of freshwater fishes, *Channa striatus* and *Mastacembelus armatus* are shown in the **list table**. The prevalence of platyhelminth parasites in freshwater fishes are showed seasonally. The prevalence of cestode parasite was (17.85 %) and trematode parasite (14.2%) in *Channa striatus* while infection of cestode parasite was (16.19%) and trematode parasite (1.9%) in *Mastacembelus armatus* during winter season **(table -1 and graph-1)**. During summer season, the infection of cestode parasite (48%) and trematode parasite (20%) in *Channa striatus* while (30.85%) infection of cestode parasite and (7.4%) **(Table-2 and Graph-2)** trematode parasite shown by *Mastacembelus armatus* and in rainy season, the infection of cestode parasite (12.5%) and trematode parasite (3.1%) in *Channa striatus* while (9.5%) infection of cestode parasite and (0%) trematode parasite shown by *Mastacembelus armatus* **(Table 3, & Graph- 3).**

List of Platyhelminthes, their host fish and organ of infection:

Sr.No.	Host (Fishes)	Platyhelminth parasites	Organ infected
1.	***Channa striatus***	**Cestoda**	
		Senga sp.	Intestine
		Trematoda	
		Azygia sp.	Stomach
		Orientocreadium sp.	Gill cavity
2.	***Mastacembelus armatus***	**Cestoda**	
		Circumonchobothrium sp.	Intestine
		Trematoda	
		Allocreadium sp.	Liver
		Genarchopsis sp.	Intestine

Table-1: Platyhelminthic infection of edible fishes during winter Season.

Sr. No.	Host	Total no. of fishes examined	Total no. of fishes infected	Parasites	No. of parasites collected	Prevalence (%)
1.	*Channa striatus*	28	5	Cestode	8	17.85
			04	Trematode	07	14.2
2.	*Mastacembelus armatus*	105	17	Cestode	21	16.19
			2	Trematode	03	1.9

Graph-1: Showing the Prevalence % in freshwater fishes during winter season.

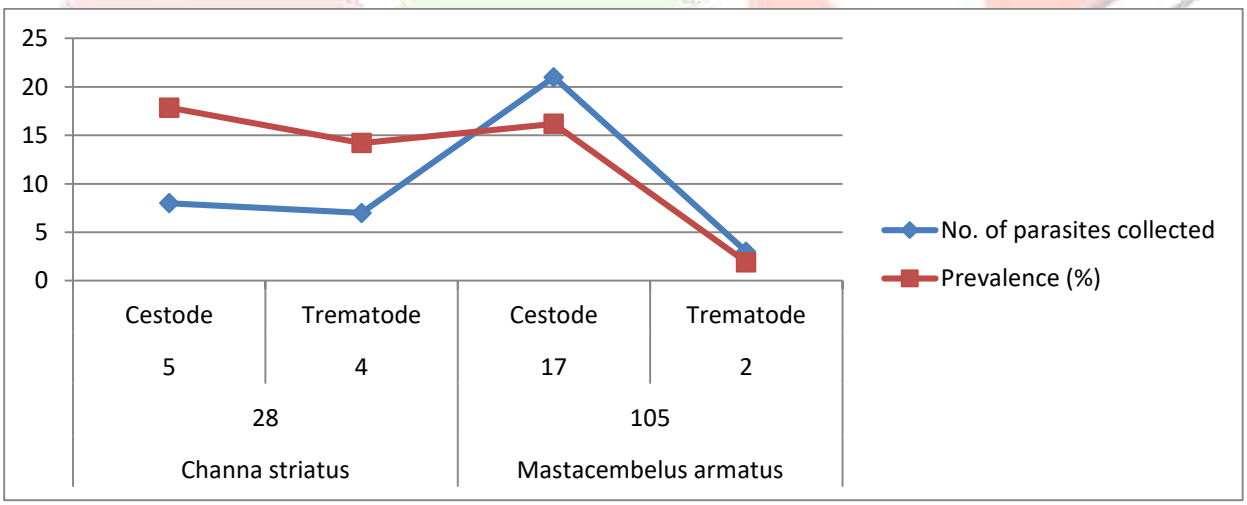


Table-2: Platyhelminthic infection of edible fishes during summer Season.

Sr. No.	Host	Total no. of fishes examined	Total no. of fishes infected	Parasites	No. of parasites collected	Prevalence (%)
1.	*Channa striatus*	25	12	Cestode	17	48
			05	Trematode	11	20
2.	*Mastacembelus armatus*	94	29	Cestode	37	30.85
			07	Trematode	12	7.4

Graph-2: Shows the Prevalence % in freshwater fishes during summer season.

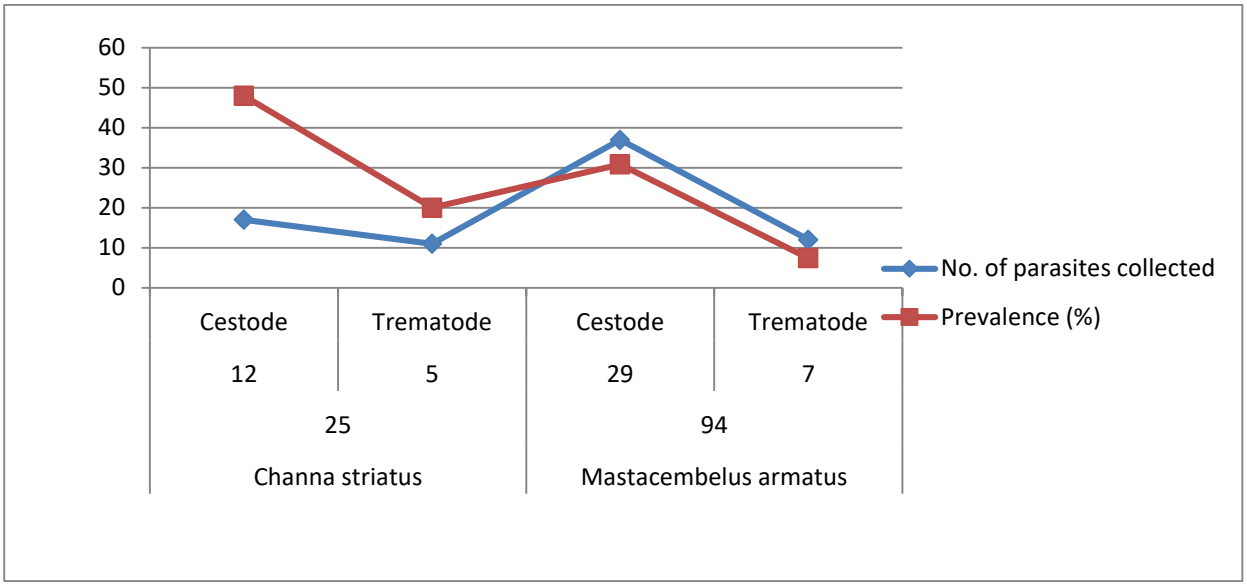
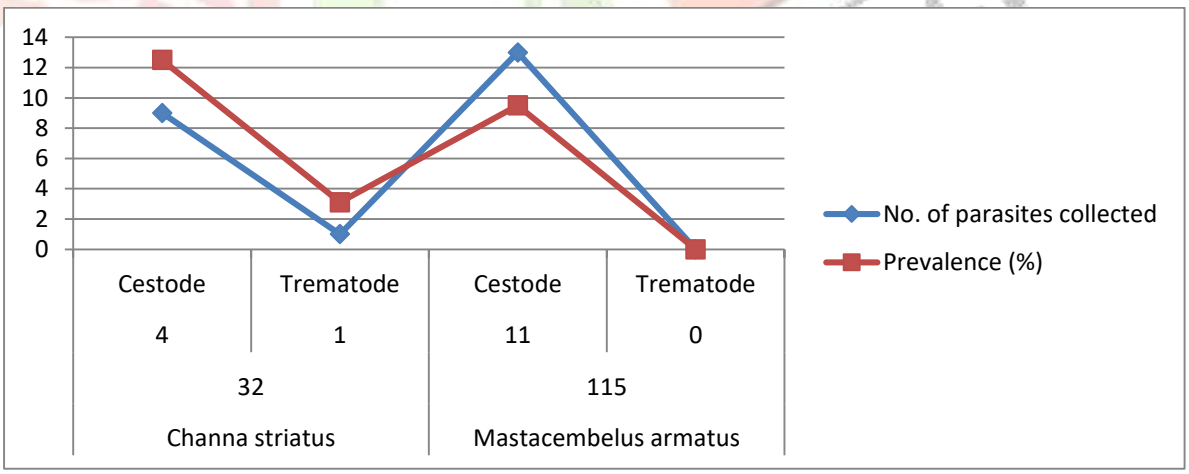


Table-3: Platyhelminthic infection of edible fishes during rainy Season:

Sr. No.	Host	Total no. of fishes examined	Total no. of fishes infected	Parasites	No. of parasites collected	Prevalence (%)
1.	*Channa striatus*	32	04	Cestode	09	12.5
			01	Trematode	01	3.1
2.	*Mastacembelus armatus*	115	11	Cestode	13	9.5
			0	Trematode	0	0

Graph-3: Shows the Prevalence % in freshwater fishes during rainy Season:



In the present results, the high prevalence of platyhelminth parasites in edible freshwater fishes was during summer season and lowest in winter and rainy seasons. The occurrence of helminth parasites in freshwater fish is influenced by a range of factors such as, water quality, temperature, turbidity, feeding habit, the presence of intermediate hosts such as snails. In addition, human activities such as deforestation and pollution can also increase the prevalence of these parasites in aquatic environments.

The present results when compared with the relevant data of prevalence in freshwater fishes was high during summer season is reported by some researchers (Fartade *et al.*, 2017, Nimbalkar *et al.*, 2010

and Podwal *et al.*, 2007) in different water bodies. Sadguru Prakash and Dharmendra Singh, (2020) has studied, the highest prevalence of cestode (48.5%), trematode (23.5%) and nematode (17.5%) parasites in freshwater air breathing fishes during summer season whereas, lowest prevalence of cestode (35.0%), trematode (7.0%) and nematode (14.0%) in rainy season. According Mukul Sinha, (2021), the highest prevalence of cestode (55.42), trematode (26.85) and nematode (21.14) parasites were recorded during summer season whereas, the lowest prevalence of cestode (37.14), trematode (8.57) and nematode (14.28) in rainy season.

Conclusions:

After the data analysis it is concluded that, the high infection of platyhelminth parasites were recorded in summer season and lowest in winter and rainy season. The factors such as, temperature, water quality, turbidity and feeding habit has influence the infections directly or indirectly. So, proper management is needed to controls the infection of parasites in freshwater fish populations including monitoring of water quality, improvement of habitat conditions, proper handling and processing of fish for human consumption that process essential to sustain the freshwater fish populations.

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